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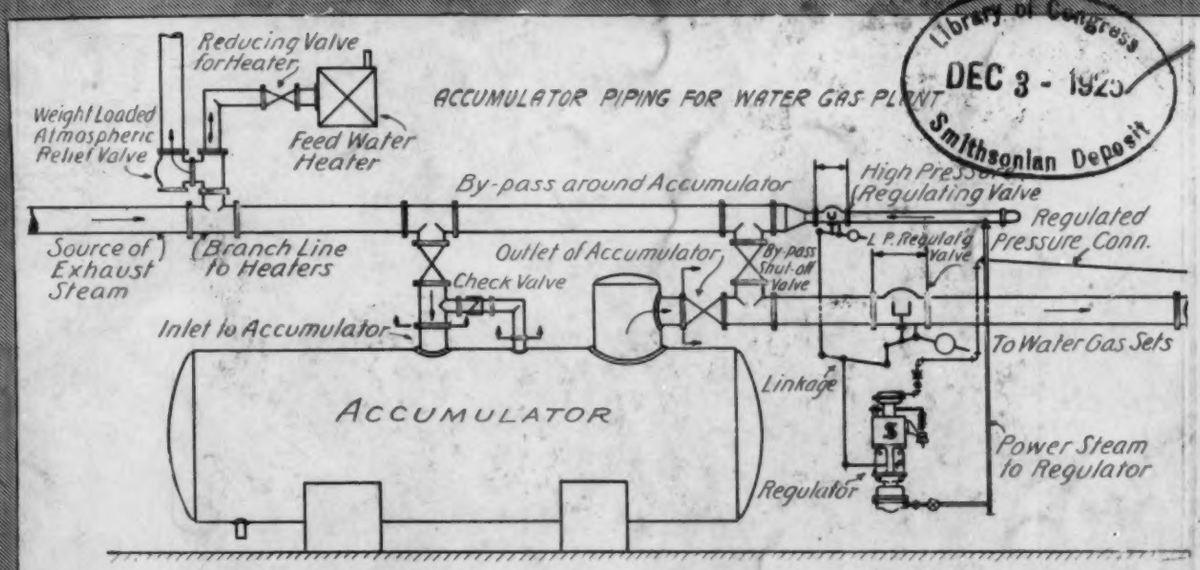

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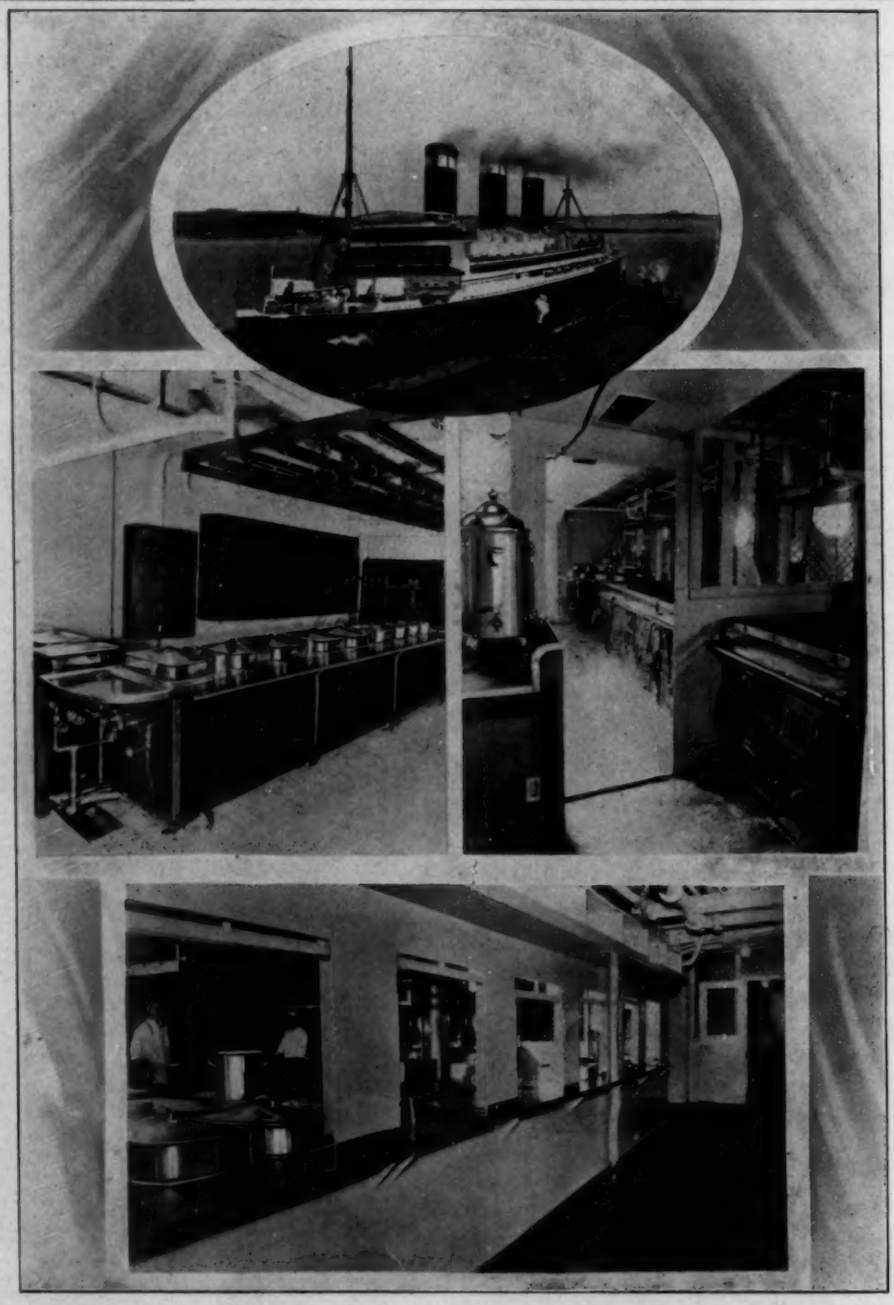

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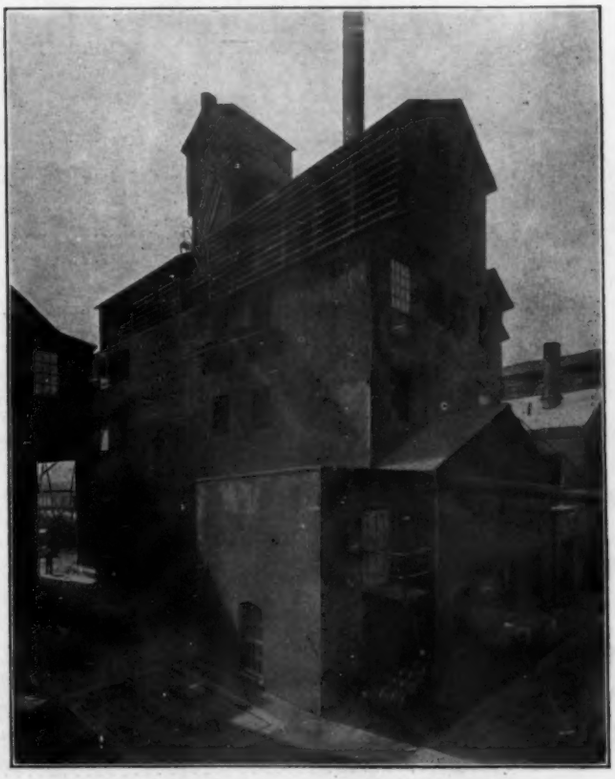

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SIXTY-SEVENTH YEAR

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"MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS"

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The Baltimore Plan of Industrial Education

As developed and applied by the Consolidated Gas, Electric Light & Power Co. of Baltimore

E. B. Luce

Educational Director

THE Baltimore Plan of Industrial Education is based upon certain definite principles, which may be briefly stated as follows:

The work of training employees into jobs should be kept close to the jobs themselves.

Existing educational institutions should be utilized to the utmost in preparing the prospective employee, prior to original selection, and subsequently to improve him in his work and develop him for promotion.

Any educational work done inside the company should be such only as is not and cannot be provided satisfactorily outside.

Co-operation with Other Educational Institutions

Any needed or desirable educational work which cannot be done wholly by schools or wholly by the company, but can be done jointly, should be done through co-operative efforts of the schools and the company. Educational work of this nature is illustrated by certain extension courses, e.g., courses for juveniles and foremen under the provision of the Smith-Hughes Act; also the starting in educational institutions of new and needed courses which are closely related to the work of the company.

E. B. Luce

All educational and training work should keep the requirements of the work which the company exists to do foremost in all plans.

Any training or education necessary for the satisfactory performance of present as contrasted with prospective duties and responsibilities may well be given on company time; other education and training should be on the employee's time or on a co-operative basis, e.g., training into jobs and essential orientational work should be given on company time, also some organized class work within the company; inspection trips which are desirable, but not essential, should be given on the employee's time.

Systematic Planning

Training and educational work should be laid out and systematized as carefully as other work. So far as possible, plans and programs should be made objective, thus opening the way to improvements. The necessary organization of departmental training representatives should be provided to study the training problems of the various departments and to co-ordinate the effort. This educational service organization should have centralized control and extend through the selection of training representatives to every part of the organization.

Individual employees should be stimulated to study and improve themselves through vocational advisement, financial co-operation and assistance, competition and rewards and prizes.

Present training facilities of the company developed over a period of years should be expanded to the limits of usefulness in the lines they can serve before others are established. Often the modification or extension of a facility may be the best way to meet a new training need.

The group method should be used for economy and effectiveness so far as possible, supplemented by work with individuals. Training into jobs must be largely individual.

What the Plan Provides For

"The Baltimore Plan" provides for:

Co-operating with employees in taking night courses, which are now so generally given throughout the country, for employed people. The outside course work is an important part of the Baltimore plan. The company advances the tuition. The employee reimburses the company. Finally the company gives a refund for successful completion.

Group educational meetings inside the company along both departmental and vocational lines. One main purpose of these meetings is orientation, i.e., instruction and information for employees in relation to the organization of the company, functions and duties of departments, public relations, etc.

Training Street Men

Training New Employees

"Training in" new employees. The organization for doing this work heads up under a field worker in the educational department. He has one or more training representatives in each department. These training representatives are responsible for the proper training of new employees.

Operating the company's library on a service basis, disseminating useful information in the form of books and pamphlets and in the form of papers prepared by employees on subjects related to the company's business.

The preparation and distribution of manuals of standardized procedure and original data pertaining to the work the company is doing.

Co-operating with employees for the purpose of helping them to keep in touch with current technical and business literature. This is done through a plan of joint expense subscriptions for selected magazines which are mailed to the home addresses of employees, and through a library circulation plan wholly at company expense.

Employees as Instructors

Encouraging suitably qualified employees to instruct in the outside night classes of co-operating eductional institutions.

Help from the industry to educational institutions in supplying equipment, building up subject matter and financing, especially when new courses are established.

Refund of tuition to adults for advanced courses for which there is tuition charge and cash prizes to juveniles for the successful completion of approved courses in free public evening schools.

Cash prizes to adults for elementary education. This is an encouragement to the employee of low grade education and gives help where help is needed. This offer disarms the criticism sometimes made that financial assistance is given only to the more highly educated who need it least of all.

Arranging with an instructor to give an extension course as a part of the so-called group educational work of the company.

Employment of Additional Instructors

The employment of professors and instructors who desire and need fresh contacts with industry in vacation time, who, during the scholastic year, instruct gas and electric employees, or those who are likely to become the company's employees. The practice of supplying teachers for outside evening and special courses, speakers for special subjects, etc., is encouraged, as are also observation and inspection trips by teachers, instructors and students, through the various branches of the industry. The instructional engineer of the educational department is a professor in electrical engineering at the Johns Hopkins University.

Inspection and Oyster Roast

Taking graduates of universities and secondary schools into apprenticeship courses and providing otherwise as may be desirable to train them into employment, in the technical, supervisory and executive jobs.

Summer Employment of College Men

Summer employment of college and other students through the exercise of careful, selective methods to insure ability and reliability. When students are in industry under this proposal, they will be work-

(Continued on page 598)

Rubber in the Gas Industry

It renders piping safe from leakage

Ismar Ginsberg

THAT important natural gum, rubber, concerning which we have been reading so much during recent times, has a very important application in the gas business. The average gas man probably knows but little about rubber and also about the important use to which it can be put in the gas works and in the gas distribution system. Those gas men who may know that rubber gaskets and rubber rings of one sort or another have been used in England, France and Germany for making joints in gas mains and pipes and that these joints have lasted for many years and have given the best results, probably have not been able to get any further practical information on the subject than what they have seen published in the trade journals. English and Continental gas practice may have seemed to them to be peculiarly adapted to the use of such jointing material and the distance that separates these countries from America served to keep the information on this subject over on the other side, so that the gas man in America was not able to secure enough practical information to enable him to try out the same method on this side. As far as the author knows, rubber has not been employed in any practical way in the making of joints on gas mains in this country.

It will, therefore, be of great interest, and not alone that, but of great practical significance, to the American gas man to learn that rubber has been used for many years, with very great success, in making absolutely tight and flexible joints in gas mains and gas pipes in Europe, and also that a special form of rubber packing and a pipe joint have been introduced into this country. It is now possible for the American gas industry to take advantage of this important improvement in distribution practice, which is perhaps the most outstanding development along these lines in recent years.

Rubber in the Gas Main

When a superficial study is made of this matter, the inevitable conclusion is reached that rubber cannot be used for this purpose. For rubber is a substance which, though possessed of considerable strength and wearability, still will not wear well if prevailing conditions are not propitious. It would perhaps appear that the use of rubber in a gas pipe, where it would come in contact with a variety of influences, such as the ingredients of the gas, the gas oil that is collected in the drips, the moisture and the chemicals, etc., in the ground, would be entirely inadvisable. It is true that these influences are potent ones and that when the rubber is used in an improper manner in a joint that had not been properly designed, for example, these influences would be able quickly to destroy the gum. Then, again, it can be understood that the nature of the rubber itself, what it contains, how much filler is mixed with it, as well as the other factors that control its vulcanization, would also have a great effect on whether or not good results could be secured with it.

It must, therefore, be stated at the outset that the good results that are being obtained with the use of rubber as a jointing material depend not only on the character of the rubber and of the materials that are admixed with it, but also on the design of the joint.

The Rubber Joint in England

It is in England that the greatest development in the use of the rubber joint has taken place. In the British journal, Gas Journal of London, November 21, 1923, there was published a very interesting and instructive article by the well-known gas engineer, Walter Hole, in which there is given a detailed account of a number of investigations that were made on the practicability of rubber as a jointing material in gas mains.

When the history of the development of rubber jointing is studied, it is seen at once that the trouble has been that the average gas engineer knows but little of the properties of rubber and of what it could be made to do under the proper conditions. Thus, the general snap conclusion that was invariably reached was that the gas liquor would quickly destroy the rubber. But when it came to a practical test on the problem it was found that no one had made one and that the condemnation of rubber for this purpose was based on pure empirical reasoning only, or just a mere hunch that it would not work well under the circumstances. Then the interesting information was disclosed, after persistent inquiry, that a large company had been using rubber rings, of the nature shown in figure 1, for a number of years, and that the results obtained had been eminently satisfactory. Hole states that an examination of rubber rings, after use for over 40 years, showed that the rubber still retained its resilience and appeared to be little worse for wear.

Properties of Rubber and Ability of Withstanding Action of Gases

The matter was of such interest to Hole that he made a number of investigations to determine the properties of the rubber which are of importance in rendering it able to withstand the various agencies which come in contact with it when it is used as a jointing material in gas mains. There are in all five factors and these pertain not only to the characteristics of the rubber itself, but also to those of the joint.

Thus the first factor is the character of the rubber composition. Then there is the degree of vulcanization to which it has been subjected; then the precise nature of the action to which it is exposed,

the extent to which the rubber is prevented from expanding owing to the type of joint employed, and finally the general conditions under which it is used.

A number of different samples of rubber, principally para rubber, were examined, these samples being subjected to different degrees of vulcanization,

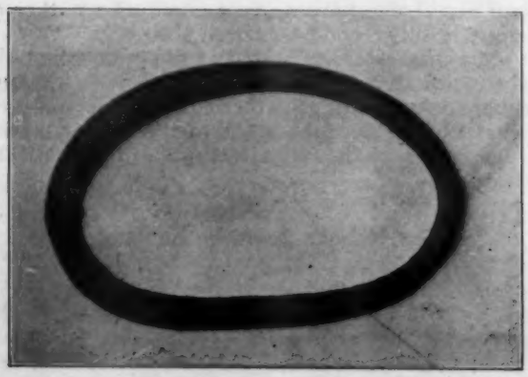


Fig. 1—Rubber Ring After Forty Years' Service on a Gas Main

varying from one-quarter vulcanized to full vulcanization. Three separate tests were made on these samples, the vapor test, the immersion test and the impingement test. Four different reagents were employed, thus, petroleum, pure benzol, toluol and solvent naphtha. The rubber samples were cut into the proper sizes and then were placed in an Erlenmeyer flask, as is seen in figure 2. The sample that dips into the reagent is being subjected to the immersion test, while that which is hanging from the cork is being subjected to the vapor test.

Results Obtained

The results obtained from these tests were very instructive. In the first place, the rubber strips increased both in size and in weight. The pure unvulcanized rubber simply became jelly like, but the semi and fully vulcanized rubber samples simply swelled up, but did not lose their clean-cut edges. The effect of solvent immersion was greater than vapor immersion, and of the four solvents petroleum had the least effect and toluene the most. It was also found that when the strips of rubber were dried they returned to the original shape, there being a slight variation, dependent on the nature of the solvent used in the test.

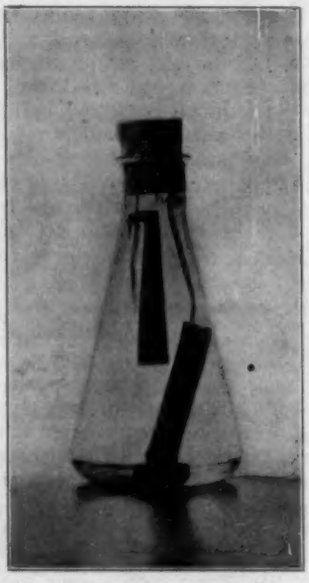


Fig. 2—The Erlenmeyer Test Flask Used in Making the Experiments

Then, again, when two rubber compositions were compared as far as the effect of vulcanization was concerned, it was found that the fully-vulcanized piece of rubber seemed to be more absorbent than the semi-vulcanized strip.

The Compression Test

The purpose of these tests was to show just what action various solvents, which may be found in gas or in gas oil, as well as in other pipe lines which are not used in the gas works, had on pieces of rubber which were suspended freely in them or allowed to come in contact with the vapors, so that all parts of the rubber strip were subject to their action. This is a condition which would not exist in the practical use of rubber rings or gaskets for making joints in mains. In the first place, the rubber would be under pressure and in the second case only a comparatively small portion of it would come in contact with the chemical agencies.

Hence another series of tests were made on pieces of rubber which were squeezed together between iron plates, as may be seen from figure 3. These

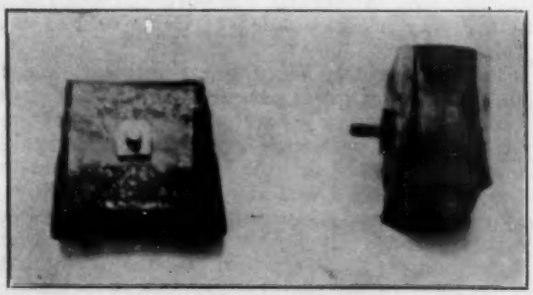


Fig. 3—Test Samples Showing Rubber Compressed

compressed samples of rubber were subjected to immersion for 50 days, with the result that the rubber became distended, as seen to the left of the figure. It was clearly demonstrated, however, that the action of the solvent had only penetrated a short distance past the edge of the iron plates. It is clear that this test better simulates the conditions that actually exist in a rubber-jointed gas main. Only a small portion of the rubber would come in contact with the gas flowing through the main and hence whatever action the gaseous ingredients had on the rubber would be limited to a small section of the entire rubber ring or gasket. It is, of course, understandable that the proportion of the rubber which is thus brought into contact with the gas will depend on the design of the joint and the properly designed joint will naturally expose as little rubber surface to the gases and at the same time not sacrifice any of the wonderful "joint-tight" properties possessed by this substance.

(Continued on page 596)

Gas Versus Competing Fuels*

It meets all requirements to rule in industrial field

D. W. Chapman

Assistant Manager, Industrial Gas Sales, the Peoples Gas Light & Coke Company, Chicago

AS one looks over the industrial field in the United States and notes the various mediums used as heat source for manufacturing operations, it seems inevitable that he should propound for himself the question—Why so many fuels in industry?

The most casual observer knows that coal, fuel oil, city gas, producer gas, electricity, oil gas and coke are in general use and that acetylene, kerosene, wood and gasoline are utilized to a considerable extent for certain operations.

There is no doubt that a person who answered the question without careful consideration would say that the variation was entirely due to comparative prices of the fuels in different localities. While price is unquestionably a big factor in maintaining the conditions referred to, we have two specific examples which seem to indicate that we must look elsewhere for the conclusive answer.

Different Fuels Used

First, in almost any industrial section where we may care to make an inspection, we shall find that, although approximately the same range of prices for the various fuels prevails throughout the district, manufacturers having similar operations use different sources of heat.

Second, just a few years ago an almost parallel situation existed in the lighting field. Electricity had some rather hefty competitors in gas, gasoline, acetylene and kerosene. Certainly from the standpoint of light volume per unit cost, electricity was not the cheapest medium for lighting, yet it has completely outstripped all others and is now supreme in the field. What is the cause of this supremacy? "Sheer Efficiency." When all facts are taken into consideration, electricity is so markedly the best medium for lighting that no competitor can hope to retain any appreciable amount of the business.

As we think about the industrial fuel situation today, it seems hardly possible that any one fuel will eventually claim the major portion of the field; but just as sure as the sun will set tonight, in the course of time, some medium of heating will be generally adopted for industrial processes.

Substantiating Argument

Let us look about us now to see if we can find some reasons to substantiate that revolutionary idea.

As manufacturers in seeking a market meet competition, they search for a method of reducing the cost of the article that they manufacture, and immediately the cry goes up—Production, more production! Large production necessitates automatic machinery, and in order to justify the investment automatic machinery necessitates large production, so that the American manufacturer spends half of his natural life striving to get rid of the production so that he can pay the interest on the money invested in the machinery. Regardless of the sanity of this system, it is with us today, and in all probability will continue to be a part of our national life.

While these automatic machines can perform a given operation in precisely the same manner for a considerable length of time, they must at all times be supplied with material of exactly uniform quality, and must be constructed in accordance with most rigid specifications, in order that the production schedule be maintained.

Heating Operations Must Be Similarly Organized

The whole tendency of modern factory methods is toward a maximum production of high quality merchandise. This condition necessarily means that heating operations, which play a major part in practically all manufacturing lines, must be organized on a similar basis.

With these facts in mind, let us see what characteristics a fuel should have to fit in with the general scheme of things. It must be: Presentable, Dependable, Controllable, Comfortable, Economical.

These are the five cardinal points that will eventually govern the selection of the one fuel that will reign supreme in the industrial field. Undoubtedly, there are many here today who will say that there are some other points that should be taken into consideration. For instance, safety. My answer to that is that a fuel that is unsafe is uncomfortable. Likewise one that will not produce the required temperature in a minimum time is uncontrollable.

Factors Have Universal Application

These characteristics are fundamental and I think that they have a somewhat universal application. If you were purchasing an automobile, a washing machine, or a new derby hat, you would desire that the qualities expressed by the five adjectives—presentable, controllable, dependable, comfortable and economical, be possessed by the articles purchased.

I tell you now, without the slightest hesitation, that no heating medium which fails to measure up to these five requirements will continue to long enjoy the patronage of progressive manufacturers.

At the present time the gas industry is meeting keen competition from crude fuels, and some of our industrial engineers, perturbed by this fact, are bending every effort to outdistance these competitors. Commendable and important as such efforts

(Continued on page 600)

*Presented at the Tuesday meeting of the Industrial Section, A. G. A. convention, Atlantic City, October 13, 1925.

Good-will Department Works Wonders

Joplin gas company organizes good-will and new business department

Ruel McDaniel

FIVE years ago a citizen of a certain section of Joplin, Missouri, quit using gas as a fuel because he could not get sufficient pressure, and because the general service was not what he thought it ought to be. Several of his neighbors followed suit at about the same time. When the Joplin Gas Company established a new business department recently, in which is also included a good-will department, one of the first steps that department took was toward bringing the old customers back to the fold.

In due time a salesman called upon this citizen who had not used the company's gas in five years. "We would like to have you as a customer again," the salesman said.

"But I had to discontinue your service because your pressure was so low that you wouldn't give me enough gas to cook with, much less to heat my house with!"

"Yes; we are aware of that fact," the salesman countered. "The trouble lay in a leaky main that led to this part of town. We have a new and larger main out this way now, and there is all the pressure you need. I know that you would get satisfactory service now."

"Will you guarantee me satisfactory service?" the former customer asked.

The salesman said he would, and proved it by writing an extra line in the contract to that effect. He not only signed the citizen up to use gas again but sold him a new $95 range to boot. Likewise he induced the former customer to give him the names of some of his neighbors who also discontinued service at the same time this man did, and some of them have since bought new ranges and have become regular users of the company's gas.

That is only one instance of many where the new department of this company is building more business and turning its customers into boosters rather than knockers.

Now Have Real Appliance Business

"Not until recently did we push appliances to any extent," said S. M. Hutchinson, manager of the new business department. "We have carried appliances on the sales floor for a number of years, and have advertised them in the papers to some extent, but we never went out and tried to sell them to the customers. Since starting an active campaign to sell appliances in a modern way we have more than doubled the best records ever made by the company in the past."

The first thing Mr. Hutchinson and his four salesmen did when the company concluded to begin merchandising goods was to make a complete survey of the city, insofar as gas users were concerned.

Making the Survey

Each man had an inspector's badge which gave him ready admittance to the homes. He was likewise well dressed, which gave him admittance to any part of the house, rather than to the meter at the back of the house. The salesman had a card which he filled out, giving the name and address of the owner of the house, the kind of gas appliances in use and their condition.

If the customer was prosperous enough, outwardly, to afford other appliances than those in use, or if some of them in use were old and worn, the salesman made a notation of the fact on the back of the card. The cards were turned in at the end of the day and the company now has enough live prospects to keep the four salesmen busy for months to come.

Building Good-Will

But it is as much the duty of the new business department to build good-will for the company as it is to make appliance sales. So the salesman goes a step further in this survey. He asks the customer if her range is behaving properly. If it isn't, he adjusts it so that it gives her the best possible service. He does the same with all the appliances. He further asks her if there is any complaint about poor meter reading or too high gas bills.

Many times there are complaints. The salesman-inspector listens to them. The few that are just he takes up with the office and has them satisfactorily adjusted. In the remainder of the cases he explains the workings of a meter, how it is read and shows her in general that her complaint is only imaginary. He likewise educates the customers as to the source of the gas she uses—tells where it comes from and how it reaches her own kitchen. When the salesman leaves the house the customer has a better understanding of her gas company and the problems it must meet and overcome. Thereafter she is not so ready to register a complaint until she knows she has one.

Office a Poor Place to Settle Disputes

"Our new method of adjusting complaints in the customer's own home is producing wonderful results," declared Mr. Hutchinson. Formerly, the only opportunity the average customer had of making a complaint was when she paid her bill. In this case she had a member of the office force to deal with—a person who does not as a rule know the technicalities of the service. When she pays the bill she often has to get in line, for there are others who are paying theirs likewise. If she takes the time to complain, then she creates dissatisfaction among those in line behind her. They are all out of humor, and they blame the company for the delay

(Continued on page 601)

GAS MERCHANDISING

Domestic – Industrial

Ideas for the Man Who Sells

William H. Matlack

A RANGE SALE THAT WAS A 200 PER CENTER

THE Portland, Oregon, Gas and Coke Company held a most successful gas range sale in September, tolling the bell in one day at 135 and with a tally of 426 ranges sold during the month.

The sale features were: the low down payment, "Only $1 Down," and an offer to take the customer's "old range as a first payment" when a new one was purchased. Unusual interest in the sale was created by playing up the "Glass Door Oven Demonstrations," which were held on Tuesday and Thursday in the Gasco building.

Newspaper space featuring modern Portland kitchens and gas bill stickers were used to advertise the sale, while the salesrooms and window displays also displayed the "spick and span range" in attractive settings.

The sale clearly indicates that the right tie-in, persuasive advertising and personal salesmanship will always show an increase in sales, in the case of Portland the increase was 200 per cent over September, 1924, when the company sold 136 ranges.

AN EXPOSITION BOOTH THAT DREW BIG CROWDS

THE Laclede Gas Light Company was one of the chief exhibitors at the Home Beautiful Exposition, held during the last week of October at the New Coliseum in St. Louis. The Laclede Company, under its new management, has become one of the most aggressive and progressive gas merchandising companies of the country. They never let an opportunity to promote better home equipment pass. In the Home Beautiful Exposition the Laclede Company exposed their merchandise to thousands of home managers through the use of six booths. Each booth displayed some particular line of labor saving and home beautifying appliance. The booth that held the greatest interest to the largest number of women, however, was the one containing the all white kitchen equipment. Porcelain, nickel and bright aluminum can always be counted upon to attract folks who are interested in the home, men, women and children.

The Laclede Company during the past year have handled a variety of kindred merchandise, as may be noted from the photograph reproduced on this page. This merchandise, company officials say, helps materially in building up the sale of the major gas-burning appliances and ranges, and water heaters are frequently sold to customers who came into the store to purchase a kitchen table or refrigerator. All appliances and home appliances sold by the company to St. Louisians may be purchased on the divided payment plan.

Gas Ranges as Christmas Gifts

A few timely suggestions on advertising and window display

W. B. Stoddard

WHAT is the thought behind the making of a Christmas gift? Is it not the giving of pleasure to one near and dear? What, then, would be more appreciated by the home-keeper—be she mother, wife, sister or daughter—than something which will lighten her daily labors and give her more time for recreation? This is the way to talk to your customers in the month preceding Christmas. And all the time you are talking you should be giving due publicity to your gas ranges through the newspapers, the show window, and by demonstrations in the salesroom and at the homes. Get the men folk to thinking about it well in advance. Also make the suggestion that perhaps the lady of the house would appreciate it all the more if it arrived a week before Christmas, so that she could use it in the preparation of the Yuletide feast. But, above all, have an air of festivity about your Christmas advertising, whatever its nature.

Barker Bros., Los Angeles, Calif., can always be counted upon to do a thoroughly efficient job of advertising and their pre-holiday gas range campaign resulted in the sale of a large number of quality stoves. In the first place, they chose a handsome looking model practically all white enamel, for specialization. Then they selected a good quality aluminum set—12 pieces, including roaster, mixing bowls, stew pans, etc., and offered the combination for $75. They also allowed purchase on the deferred payment plan, with an initial payment of $5. Furthermore, they advised that they would accept an old range at a liberal allowance.

Advertising the Offer

They took half a page in the papers to call attention to their gas range offer, showing at the top a Christmas tree, surrounded by aluminum utensils, all being admired by a housewife. Their window display was of a nature befitting this aristocrat of the kitchen. Curtains of smoke grey hung in heavy folds in the rear and to them were fastened two large wreaths of evergreen and holly, from which depended streamers of American tinsel. On a black-draped platform was one of the white ranges, while at one side, on a bench, was the aluminum set. On

(Continued on page 599)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 96

Heat and Change of State

HEAT RECUPERATION

The manner in which gaseous fuel is burned in a furnace that is employed in an industrial operation makes it necessary that the heat that is present in the flue gases, as they leave the furnace, be recovered in some suitable manner. Furthermore, when an operation is being carried out on a comparatively high temperature, for example, at a 1,000 or 1,500 degree F., it stands to reason that this operation cannot be performed unless the flue gases leave the apparatus at this temperature, or, in fact, at a temperature which is 100 degrees or so higher. Processes that must be carried out at a temperature of 1,500 degrees F., for example, necessitate the burning of fuel at the proper rate to give that temperature and also the leaving of the flue gases at least 1,500 degrees F. or at some higher temperature.

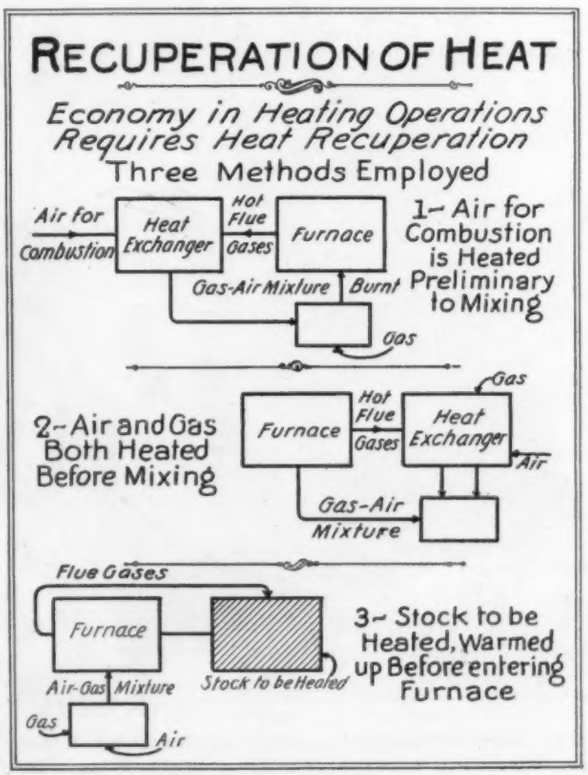
Thus it follows that there is a considerable quantity of heat that is left in the flue gases, as they leave the furnace. If this heat is permitted to go to waste by allowing the flue gases as such to escape up the chimney, it is easy to see that the economy of the process will not be very great. On the other hand, it is possible to obtain a higher degree of efficiency in heat utilization by taking advantage of the heat that is contained in these gases.

Installing a Recuperator

This is done by installing a recuperator or a heat recovery apparatus on the furnace and making the flue gases pass through this heat exchanger so that the heat contained in the combustion gases, after they leave the furnace, is made available for some useful purpose. In gas-fired furnaces it is generally necessary to provide some sort of heat recuperating apparatus in order to secure high efficiency and lower costs in the heating process.

Heat Recovered in Different Ways

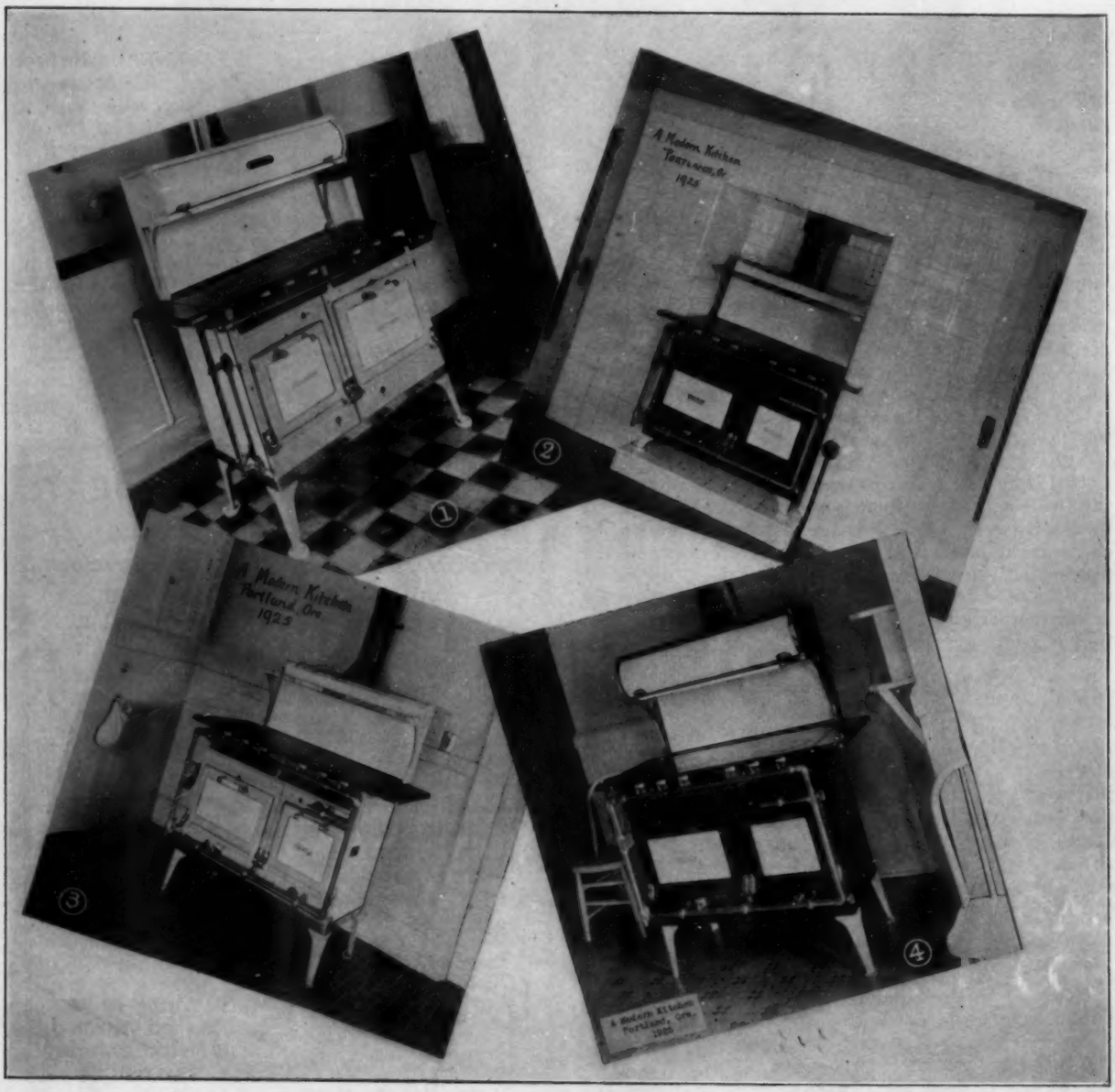
The heat in the combustion gases is recovered in a number of different ways. At times the heat exchanger is arranged in such a fashion that the work that is to be heated is preheated. This, of course, can only be done in such cases where conditions are right for the application of preliminary heating of this sort. Then, again, the heat that is contained in the combustion gases as they leave the furnace may be used to preheat the gaseous fuel that is employed in firing the furnace. It is possible also to use this heat in raising the temperature of the air that is eventually mixed with the fuel before it is burned. Each one of these methods may be employed alone or in conjunction with any of the others. Thus, for example, recuperation may take place by preliminary heating of both air and fuel. All of them serve to make use of the large amount of waste heat that is generally allowed to pass up the chimney along with the flue gases.



Controlling Conditions

There are a number of conditions which control the preliminary heating of the gaseous fuel and air. In the first place it is, of course, understandable that when the gaseous fuel employed is composed of ingredients that are combustible at comparatively low temperatures, it would be inadvisable to preheat the gas. Thus, for example, in the case of natural gases, which are rich in the higher hydrocarbons, preheating to too high a temperature is inadmissible. When this happens, it is understandable that, instead of increasing the economy of the heating process, the opposite will take place and the consumption of gas will increase with a loss in calorific power, caused by the decomposition of these high molecular weight hydrocarbons.

It thus follows that gaseous fuel which is best suited for preheating to high temperatures is of the character of blue water gas or slightly carburetted water gas which does not contain large amounts of the heavier and more readily decomposable hydrocarbons.



How Some Portland, Oregon, Home Managers Arrange Their Gas Ranges—A Few Fine Examples of Range Settings in the Modern Kitchen

As The Journal Views It

GEORGE D. ROPER

It is with great regret that we have learned of the death of George D. Roper. Mr. Roper, as all gas men know, was very active in the gas industry. He was a man who gave his time and energy in promoting the interests of gas, particularly of the manufacturers' section, which is concerned with the appliance end of the business. He was possessed of tireless energy and was always ready to meet any demands made of him if it was for the advancement and betterment of the gas industry. He was honored, not only by his industry, but in his own city, where he has been hailed as a great civic leader.

The gas industry and the city of Rockford, Illinois where he made his home, lose a real friend, one who was ever ready to lend his aid to all important movements and developments, in the death of Mr. Roper.

In passing, we cannot help but call attention to the fact that Mr. Roper very kindly responded to a request, made by the editor, for a statement on the important movements and developments of the gas industry, which statement was published in the symposium contained in the October 10th issue of The American Gas Journal.

Our sincerest sympathy is extended to his bereaved family and his many friends.

PUBLIC UTILITY OWNERSHIP

One of the most important movements in the public utility industry, particularly in the gas industry, has been the development of a large body of investors owning stocks and bonds in public utility companies. It has been mentioned a number of times that this movement possesses great significance, not only to the public utility industry, but to the fundamental welfare of its customers, and, in the effect of our entire national body. Numerous times bankers and economists of note have called attention to this movement, have described its beneficial effects on the whole nation and have given their unqualified approval of the efforts of the public utility companies to finance their enterprises through the aid of their employees, customers and small investors in general. It is a movement which is by no means limited to the public utility field, but also extends to other industries, but it is equally true that the securities that are offered to the investors by public utility industries, including not only gas and electricity, but also street railways and railroads, offer both greater security of investment and dividend returns.

It is thus very surprising to find that some people still believe that the only motive that has ever actuated successful business enterprises in this country has been the entirely selfish one of making money by taking advantage of the small investor. It is rather extraordinary that a publicist who has given the matter due consideration and careful thought should come to such a conclusion, should make so vigorous an assault upon the present-day methods of corporate financing and the present tendency toward wide diffusion of the ownership of securities of public utility and other industrial organizations, so as to make it necessary for a representative gas man to make a reply to these erroneous statements.

In the present issue of the Journal there is published a summary of the answer of a prominent gas man to those unwarranted assertions. It was stated in unequivocal terms by the accuser of the financial methods of the public utility industry that the companies have been issuing securities and selling them to the investor far beyond the limits placed by their tangible assets. This most condemning statement is ably answered and proven to be an entirely false and exaggerated criticism of American business and particularly of the gas business.

A brief reading of the history of the gas industry will show that at all times it has not been an absolute monopoly, but that it had to compete with other mediums of lighting and heating and that it did all that it could to improve its methods, increase the efficiency of its manufacture so that eventually the cost of gas making was materially reduced. Take for example, the case of New York, where, in 1826, gas was sold at $10 per 1,000 cubic feet and where today the price is $1.15 a thousand, in spite of the fact that the costs of all materials and labor as well are exceedingly higher today than in the early part of the 19th century.

As the gas industry grew, demands for its service increased and today the industry is exerting every effort to give as good service as possible. In order to do so it requires capital and it is a fact that the regulation to which it has been subjected has been a deterrent in attracting new capital into the industry. Nevertheless, the return on the investment has always been sure and, in fact, it is so certain that even the most conservative of institutions, such as the mutual life insurance companies and savings banks, have invested largely in gas and other utility securities.

Today it is true that the public utilities are owned by the American people. Public ownership has been the means of bringing about a better understanding of the problems of the utility industry. It has made people of a community realize that after all the public utilities are their own industries and that their entire welfare is irrevocably bound up with the progress and development of these utilities. There is, therefore, absolutely no reason at all why they should not be interested, not merely academically but financially, in these utilities which have had and will continue to have so important an influence on American life.

Those Two Bugbears

J. B. Dillon

IT is said that most everybody has a pet hobby, and we guess that this is true, the hobbies varying just as much as does the selection of our favorite colors. Some like red, some like blue—.

Just now we are interested in the B.t.u., and while thinking of that unit and the various theories, both correct and incorrect, our thought carries us to vitamines and the multitudinous treatises written on the vitamine and the amount of windjamming that has been done relative to the B.t.u.

"Unless you eat food with vitamines A plus B you will become mentally deficient; fail to develop physically," etc.

A young man went into the drug store and asked for a bottle of vitamines. The druggist admitted that he did not know just what they were all talking about, but he understood that there were lots of vitamines in cabbage.

And this is about as much as some of the windjammers know about the B.t.u.

"Unless our gas is 10 per cent B.t.u. we will not permit it to be served to our city."

"Why?"

"Well, we do not know, but we understand that this is necessary."

Yet the gas companies have been giving the cities the proper amount of heat units, with the end in view of serving a splendid gas at minimum cost, but some two by four chemist makes a test and finds that there is a little shortage on the B.t.u., according to the formula, and he starts the babble, but he fails to mention that you cannot get diamonds for the price of bottle glass.

All of this came before us when we see George Wehrle, superintendent of Public Service Company of Colorado's gas department, has been called to Spokane and Olympia, Washington, to discuss the B.t.u. with the Public Service Commission of the Washington State. The city officials of some cities in Washington wanted the price of gas reduced "but durned if they would give up a single B.t.u.," but when Mr. Wenrle got through explaining that they were making a mountain out of a mole-hill, that they could not get something for nothing, but a splendid heating gas for less money, there wasn't so much love for the few little B.t.u.'s that were cast off and it was agreed that the B.t.u. could be changed from 530 to 450.

One of the ladies present said that if this did not mean that she had to start supper at 4.50 instead of 5.30 she was perfectly satisfied, and George told her that the gas at his home was just like that she would get, and his wife did not start until 5.50 and it was all ready by 6. "Well, isn't gas wonderful," and then the meeting adjourned.

Heat units of gas in Washington: In May, 1924, the B.t.u. at Seattle was changed from 600 to 500; Tacoma from600 to 450; Spokane from 600 to 530, and now Spokane agrees to 450, same as Tacoma.

In making the reduction of the B.t.u., the gas company will make a rate to please the pocketbook, and that is the vitamine of the B.t.u.

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

TESTING OF COKE

SAMPLING, where coke is loaded down a shoot into trucks, may best be carried out by inserting a scoop into the falling stream at regular intervals, the total sample being crushed and quartered to give a convenient sample. In sampling a wagon load, 200 lbs. per car load up to 1,000 lbs. in all, are taken by means which shall insure that a cross-section of the wagon is taken. To sample coke from a bench of ovens is very difficult, and no recommendation is given.

Real specific gravity is found by grinding the coke down and weighing in a weighing bottle full of water. It is necessary to boil for about an hour and desirable to crush as finely as possible, say to 200-mesh rather than 60. Apparent specific gravity determinations are questionable owing to the immediate expulsion of air on immersion. Anderson's method (J., 1896, 15) is preferred.

Porosity determinations are not recommended owing to difficulties due to closed pores. The porosity is best calculated from the true and apparent specific gravities. Shatter tests are carried out by allowing a sample to fall four times from a box at a height of 6 ft. on to a steel plate, and sieving the resulting fragments through a 2-in. screen. A larger sample, large coke, a series of screens, and the mean of many experiments are recommended.

Tumbler test. A sample of sized coke is rotated in a standard drum at a uniform rate, and the percentage remaining on a ¼-in. screen is called the hardness number. The method as at present used cannot be looked upon as giving results capable of interpretation into blast-furnace performance. Crushing strength is determined by testing a 1-in. cube in a usual type of machine. Many determinations are necessary. The results are of no practical importance.

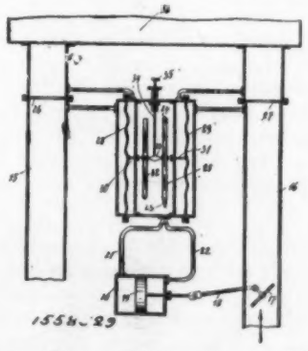
The combustibility and reactivity of coke are terms which may or may not be interchangeable, and the problem of their determination still awaits solution. Four methods of test are described and criticized: (1) Rate of reaction with carbon dioxide at about 950 degrees. The small size of coke used may not be representative of the large sizes used in practice, and true relative values cannot be obtained owing to the dilution of the carbon dioxide by the monoxide during the course of the reaction.

(2) Rate of reaction with oxygen at 400 degrees. These rates of reaction may not be the same at another temperature, and 400 degrees is far removed from the temperature prevailing in practice. (3) Rate of reaction with air in a small furnace at a high temperature. This method seems open to the least objection, although it is difficult to maintain a uniform fuel bed and to control its temperature, and channeling may take place in it. (4) The temperature of ignition is determined. It is not certain that combustibility and ignition temperature are related. —(Fuel, 1925, 4, 353-356, 410-413.)

GAS MIXTURE REGULATOR

UNITED States patent 1,558,529 describes a gas mixture regulator, as shown in the accompanying illustration.

In this regulator pressure pipes are provided for carrying the gases that are to be mixed. There is another pipe through which a medium under pressure is made to flow. Means are available for moving the last mentioned pipe in opposite directions corresponding to the rising or falling pressure in the pressure pipes. There is also device which is operated by the aforementioned pressure medium escaping from the pipe. This action is taken advantage of in effecting the regulation of the mixture.



HAZARDS IN MANHOLES

THIS is the title of a report on investigations made by the Bureau of Mines, designated as serial number 2710, October, 1925.

It is concerned with the explosions that occur from time to time in the street manholes, and in it an endeavor has been made to develop the causes of these explosions. A large number of individual cases, as reported in the newspapers, are mentioned. The interesting point that can be developed from a study of these technical examples of manhole explosions is that there are many other reasons for these explosions than the commonly supposed one, namely, the escape of gas from gas mains.

Considerable portion of the report is devoted to the study of carbon monoxide, its properties and methods of testing its presence in the air. Other portions of the report are concerned with the precautions that should be taken in entering manholes and also with first aid to gassed manhole workers.

RUBBER IN THE GAS INDUSTRY

(Continued from page 586)

Impingement Tests

Another series of tests were carried out in which the rubber was subjected to the action of a fine stream of the solvent or rather a fine stream of air which had first been saturated with the solvent. The purpose of this test was to render experimental conditions as nearly like those that exist in practice as possible. The action of the vapors of various chemicals in the gas is simulated by the impingement of a stream of vapor-saturated air. Here, again, the experimental conditions were, however, much more severe than what exists in practice. Thus the average coal gas would contain only one-fifth of the benzol that is contained in air that is saturated with that substance. A small blister was formed at the point of impingement, but this was inconsequential, for, as Hole states: "If the fears expressed by many as to the detrimental action of coal gas upon rubber were well founded, one would have expected that the impingement of the most detrimental of all the constituents of coal gas, in such a fine stream, in such a large total volume for so long a time, and upon such a very small area, would have resulted in the complete perforation of the rubber samples under test.

Tests which were made with naphthalene showed that the surface of the rubber was hardened a little. but when this surface crust was broken by gentle pulling the elasticity of the rubber was observed to be unaffected. This applies to the raw rubber, while the vulcanized rubber was not affected in the least except in a gain in weight.

Examination of Rubber Rings from Gas Mains

In the remainder of his article, Hole tells of the results that he obtained in examining various rubber rings that had been used for a prolonged period of years in jointing gas mains. In general, the rubber rings gave very satisfactory results wherever they were used. This confirms the experience of both French and Continental gas engineers. Thus, in the city of Lyons, rubber joints have been used for more than 45 years and in all that time the results were entirely satisfactory. The mains in which the rubber rings were employed distributed low pressure gas as well as high pressure gas, and in both cases most favorable effects were obtained. The fact that it gave just as good results when used on both the high pressure and the low pressure systems would indicate that there is scarcely any doubt but that rubber will stand up very well against any of the conditions that it has to meet in practical application on gas mains.

Effect of Gas Oil on the Rubber

It has been mentioned above that American gas men can now avail themselves of the opportunity of using the rubber joint on gas mains, as a very carefully designed and perfectly satisfactory joint, known as the Victualic joint, is now on the American market. The rubber that is used in making this joint has been compounded in a special manner so that it is as resistant as possible to the action of gas oil and the ingredients in the gases that are distributed through the mains in which it may be used. The author observed a test on the action of the gas oil on this rubber. After a piece of the rubber had been allowed to remain in the gas oil for a number of months it was removed. The rubber had swelled up considerably and had softened, but not losing its resiliency. It was allowed to remain in the air and the gas oil ingredients soon evaporated, with the result that the rubber returned to its original condition and original resiliency. No chemical action had taken place.

All the results that have been obtained with the use of rubber rings in gas mains point to the fact that it is a material which can be used without any

Fig. 4—Mains with Rubber Joints (Victaulic) in an English Gas Works

fear whatsoever for this purpose. It stands up against all corrosive and destructive agencies, not merely for a short period of time, but over a prolonged period of years which will satisfy the most exacting engineer. It is, of course, a fact that if the rubber is entirely or largely exposed when used in making the joint, then the action of the soil ingredients and the soil itself may be felt before very long. Thus, if the ordinary bell and spigot joint were made of this substance, it is possible that before long the joint would become leaky. It is far more preferable to use the rubber packing in an enclosed type of joint and the advantages gained by the use of such a well-constructed joint as Victaulic are more than the mere obtaining of an absolutely permanently tight joint.

Hole's Conclusions

It is interesting to mention some of the conclusions that Hole reached on this important matter. In the first place, it was found that the most dangerous constituents of gas have little or no deleterious effect on a fully vulcanized rubber whose composition is suitable for the purpose to which the product

is to be put. This was found to be true even where the rubber had room to expand, and it made no difference whether the rubber was in contact with vapors of the solvents or the solvents themselves. When the rubber is employed in a joint it must be mentioned that there is no free contact with the stream of gas at all, and it hence follows that if the rubber stands up so well against the action of these ingredients under extremely severe experimental conditions, it will resist immeasurably more the action of the actual gas in the gas main.

Another important matter is that when the rubber is held in compression in the gas main joint it follows that the action of the gases, no matter what it might be and how deleterious it might be, cannot penetrate beneath the outer skin of the rubber mass.

Rubber Rings After 50 Years Still Elastic

Rubber rings removed from gas mains in contact with subsoil of large towns for nearly 50 years still possessed very considerable elasticity, and there was no effect of the exposure to the coal gas that could be detected with the naked eye. The net conclusion is simply this, that there can be no reason at all why rubber cannot be employed as a jointing material in gas mains and a great many reasons why its use will be of decided advantage to the gas company.

Before leaving this subject, a word must be said about the latest development which involves the use of a specially designed joint and a specially compounded rubber for this purpose. In the design of the joint, known as Victualic, great simplicity is secured and at the same time the rubber is allowed to

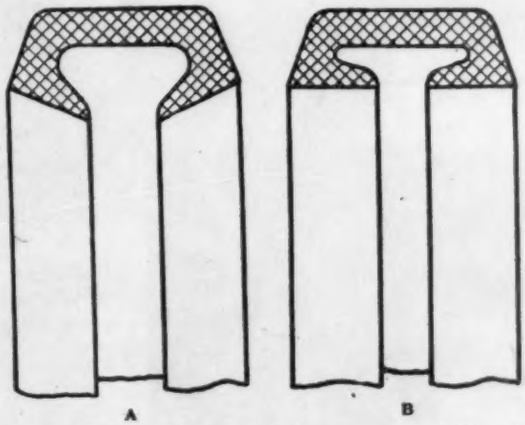


Fig. 5—Showing What Happens to the Rubber Ring in the Victaulic Joint

A indicates original ring; B the ring under pressure

come in contact with the gas over a very limited area. The joint is made in such a manner that any pressure against the rubber simply makes the joints tighter. Thus, if it is felt that the rubber should expand materially, due to the action of the gas on the part that is in contact with it, then this expansion will merely serve to increase the tightness of the joint. This refers as well to pressure that may be exerted on the joint from external sources.

An Interesting Test

A large gas company has been conducting a series of tests on the joint. An 8-inch wrought iron pipe was capped at both ends. A gauge was connected to the pipe and more than two atmospheres pressure were applied to the pipe. The pipe length contained three Victaulic joints. A platform was then attached to the pipe and this platform was loaded down with over one ton of dead load. The weight of the load caused a considerable sag in the pipe, which was supported on two upright supports, about 40 feet apart. The sag amounted to more than four and one-half inches and in spite of this considerable deflection in the pipe there was no sign of any lost pressure within the interior due to leakage through the joints. In other words, the pressure gauge did not indicate anything but the original pressure that had been applied to the pipe. This is indeed a very severe test and much more rigorous than would correspond to any condition that the length of pipe would have to meet in actual distribution practice. But the joint stood up securely against this rough handling and this is due to the excellent construction of the joint and its flexing qualities.

Another Test

Another test that was also made on this same line of piping with dead load removed. The entire line of pipe was raised by means of a crane and then dropped on to the top of the wooden supports that held it in position as described above. This is an extraordinarily severe test and could scarcely be met with in regular practice except perhaps when the piping is dropped into the trench. Nevertheless, the joint held tight. There was no variation in pressure as indicated on the pressure gauge. There could hardly be any doubt that a pipe joint which has been subjected to such rough handling and which stood up against this treatment will remain tight permanently in the ground.

Further Uses of Rubber Jointing on Pipes

Not only the pipes that are employed in the distribution of gas throughout the city, but also those that are employed in the gas works itself, can be advantageously jointed with rubber jointing. Furthermore, the jointing can be used and is being used with good results on oil lines and water mains. The author himself saw a simple test performed on a length of pipe which had several Victaulic joints in it made with rubber rings and which was under 230 pounds of water pressure. One end of the pipe hung down loosely from a pipe line which was placed around the sides of a room and in which there were several pipe joints. The loose end of the pipe was moved from side to side, putting the joint under considerable distortion, but there was absolutely no loss of pressure as shown on the pressure gauge.

The Joint Under Fire

It has been mentioned above that the rubber joint has been used both in England and on the Conti-

nent for quite some time and the results have been very satisfactory indeed. An interesting experience which was had with a pipe line which was jointed in this manner, and in which the Victaulic joint was employed, is described by an English gas works. The line was in one building on the works which took fire. It was on an eight-inch gas main which was laid under a series of wooden buildings in a suitable trench. One of the wooden buildings caught fire on the under side which formed the roof of the trench and burned fiercely for quite some time. The main was located about five feet below the actual fire, but some of the burning material, it is said, fell right on the pipe. The gas was turned off as soon as the fire started and when the fire had been extinguished and the gas turned on once more there was no leak at all in the joints.

This is just one of the many tests to which the rubber joint can be put and from which it will emerge, substantiating all the claims that are made for it. From the past experience of gas companies and gas engineers with rubber jointing material it would appear that the future of rubber in the gas field is a very bright one and that it will go far in solving one of the most troublesome of all distribution problems, leakage.

THE BALTIMORE PLAN OF INDUSTRIAL EDUCATION

(Continued from page 584)

ers, but this status in no way inhibits the learning process if the worker will use his legs, eyes, ears, tongue and notebook.

Encouraging representatives of the educational department of the company whenever opportunity is offered, to co-operate actively in serving on committees of educational institutions, and also to render assistance in securing enrollments of students for night and special courses. The Baltimore Plan of Co-operative Industrial Education applies not only to universities, but to other educational institutions; not to employees interested only in engineering, but to any other group of workers that can profit by some phase of the plan. The control is always centered in the company, hence the utilization of the scheme can be fitted to the educational and training needs of the company.

The Company Is the Basic Instrument

The Consolidated Gas, Electric Light & Power Company of Baltimore is itself the basic instrument in the system of education which it is carrying on. However, all educational facilities and agencies which are available in the community and elsewhere, namely universities, public schools, private schools, libraries, current literature, correspondence schools, local and national organizations, prizes for individual effort, etc., which may be useful in promoting the work of the company, are utilized. The plan is democratic, the belief being that education, to be effective, must be widespread in interest, responsibility and effort; but it is directed by a central planning and co-operating department.

"The Baltimore Plan of Industrial Education" is operated on the basis of supplying the educational needs of industry and workers and not on the basis of supplying the needs of educational institutions and students.

Radio Demonstration in the Gas Company's Auditorium

GAS RANGES AS CHRISTMAS GIFTS

(Continued from page 590)

the floor was one of the sets, boxed and tied with red ribbons.

A circular letter gotten out and mailed to a list of business men turned the thoughts of many of them towards the purchase of a modern range:

MARY GIVES HER IDEAS ON CHRISTMAS GIVING

"Do you know what I'd like most for this Christmas? It may sound prosaic to you, husband mine, but you don't struggle every day over this abominable range. I want a modern gas range. You can get them, you know, with Heat Control. Think of it! I could just set the oven and go off until things are done! We could turn in this old thing and it would help pay for the new one. And, dear, we don't have to pay for it all at once. We can make easy payments all the year. I certainly would like it—and I'd be so surprised on Christmas morning to see a new range standing in the kitchen.

Window Display May Co.'s Store Los Angeles, Cal.

Window Display Capwell's Store Oakland, Cal.

"And oh, yes, I forgot to tell you—they offer a whole set of aluminum free with this range—and I know you'd be delighted with the delicious things I could make in this new ware."

A Cooking Demonstration

In addition to their various forms of advertising they gave a three-day demonstration of cooking in their salesroom—the demonstrator laying special stress on the oven control. Aluminum ware was used in the baking demonstrations, and a complete set of the ware given with the stove was always on view where all could see.

The Eastern Outfitting Company was another firm that had an effective ad, stressing the suitability of a gas range for a Christmas gift. A young couple was seen peering through the curtains at a white enamel range, which stood out distinctly, as it was surrounded by a wreath of holly. The big ad. was captioned:

WHEN SHE SEES WHAT SANTA LEFT ON CHRISTMAS MORN—

Her heart will beat with genuine delight—for there—in place of her old stove—will be the real gas range you promised her. Just what she had been wishing and waiting for—and the commendation of her heartfelt gratitude will be yours—for such good judgment and timely action! Happiness will be hers!

* * * * * * * *

And if you want to cap the climax, just tell her that installation and connection was made without additional charge—and that our fair allowance granted on your old range after expert appraisal, has been credited to your account.

Another Attractive Ad.

The May Co., Los Angeles, early in December, came out with a big ad. bordered with turkeys, in which they said:

COOK THE CHRISTMAS TURKEY IN A GAS RANGE

Assure the proper temperature at all times with a heat regulator.

How's this for talking turkey? We will allow you $10 for your old cabinet model range or $5 for your old low oven range. This applies to any make of range, regardless of age or condition.

$10 puts a modern gas range in your home in time to use it in preparing the Christmas feast. Balance payable in easy monthly payments.

In order to call attention to their December sale of ranges they arranged a window that attracted all home lovers. Long black velvet curtains hung in the rear, and in front of this were two white enamel ranges, one of which was elevated on a black draped box. Grouped about were aids for preparing the holiday dinner. Grouped about were aluminum utensils given in connection with the sale of the range.

ROAST A TURKEY

or prepare an entire meal in the oven or on top of one of the burners of our new gas range.

This card was one of the outstanding features of a cleancut display arranged by Capwells, Oakland, Calif. At one end was a table heaped high with aluminum utensils, while a low bench held numerous small pieces. At the other end was a gas range with a card calling attention to several new devices. The background of the display was of deep blue with a rainbow border of white, making an effective setting for the shining black enamel.

GAS VERSUS COMPETING FUELS

(Continued from page 587)

may be, our engineers must not let their work along these lines cause them to lose sight of the competitors of the future.

Competition Must Be Permanently Overcome

We who are employed by public utilities are engaged in a business where the ratio of investment to income is very high. This means that our business must endure for long periods in order that the huge capital investment may be justified. There is just one tenable policy for the managers of gas companies to follow, if they expect lasting success in the industrial field, that is, to locate the competitor that seems most likely to prove troublesome in the future and lick him now so thoroughly that he will stay licked.

If we take the heating mediums now in use and check each in turn for the qualities previously outlined, it will be evident that there are but two in the entire list that can satisfactorily meet the exacting requirements of modern industry. Those two are gas and electricity.

Probably within the next few years, and certainly within the next ten, the progress which is made by the engineers who are designing gas and electric furnace equipment will determine for all time which is to be supreme.

Gas Man's Chance of Success

What are the gas man's chances of success? We can design furnaces that will be just as presentable and comfortable as the electric, and, judging from past experiences, we shall be having a slight advantage in dependability. The subject of controllability does not present any particularly difficult problems for the gas engineer and the high flame temperatures that are obtainable make it possible to bring gas furnaces up to the desired working temperatures in shorter time than that required for electric furnaces.

We now have checked off four of the five desirable qualities with city gas in a most favorable position when we are struck with the irony of the situation that confronts us.

Electricity selling at one cent per kilowatt hour and city gas of 530 B.t.u. per cubic foot selling at $1.55 per thousand cubic feet furnish an exactly equivalent amount of heat per dollar expended. In our larger cities, when electric rates of one cent per kw. and gas rates of approximately 60 cents per thousand are in effect, one dollar expended for gas will purchase over two and one-half times as many heat units as a dollar expended for electricity.

Strange to say, it is this feature of economy where gas has the greatest inherent advantage that furnishes the most vulnerable point of attack for the electric man.

Efficiency of the Furnace

Because of the absence of products of combustion and the consequent lack of flue losses, it is a relatively simple proposition to design an electric furnace of higher efficiency than a gas furnace, but, fortunately, there are two positive limits to this efficiency, one fixed and the other in the hands of the gas engineers.

Assuming that the progress made in improving methods of gas manufacture keeps pace with that made in the generation of electricity, the fundamental ratio of 2½ to 1 in heating values per unit of purchase price will continue to endure. That means that an electric furnace must be two and one-half times as efficient as a gas furnace in order to compete with it in the energy or fuel cost. As an electric furnace cannot be over 100 per cent efficient (in spite of some 120 per cent figures that I saw in a calculation recently) and as the reciprocal of 2.5 is .4/10, it is apparent that the gas man has his opponent tied to a post as soon as it is possible to produce industrial gas appliances that have a thermal efficiency in excess of 40 per cent.

If my deductions are correct, and I believe that they are, we who are engaged in the gas business have the situation in our own hands. What should we do about it?

More Aggressive Sales Policy

We should develop a more aggressive sales policy. We should offer to our customers only the best furnaces that are available and we should discourage any attempt on the part of the customer to reduce first cost at the sacrifice of operating efficiency by remodeling old furnaces to burn gas or purchasing equipment not properly insulated.

There should be no hesitancy in making a definite guarantee as to the performance of the equipment quoted upon, and, in many instances, a more liberal policy as regards time payments should be adopted in order to meet on an even footing the propositions being made by our competitors.

Gas-Made Products Equal of Electrically Made

Some means must be found of combating the idea fast becoming prevalent that products are necessarily of superior quality because they have been heated electrically.

In this fast moving civilization of ours, there is a natural tendency to accept anything new as being superior to the old. Electric heating, being comparatively new, has a romantic appeal and powerful interests are at work, drumming into the mind of the public that electric heating and superior quality are synonymous.

I would suggest in this connection that a series of tests be conducted by unbiased observers in our universities or by the staffs of commercial laboratories to demonstrate that materials heat-treated with gas are at least equal in quality to those treated electrically. Basic proof of this kind is absolutely essential to offset the campaign that is being waged against industrial gas.

Research

Something must be done immediately to get some form of research bureau and some large manufacturing organizations comparable to those gigantic corporations existing in the electric business to focus their attention and concentrate their efforts on the problem of developing and marketing better industrial gas equipment.

In order to show what can be accomplished by a little effort in this direction, I wish to relate briefly a story of a recent experience that we had in Chicago.

An electric manufacturer succeeded in getting an electric heat treatment furnace installed in the plant of one of our largest industrial customers. This furnace and auxiliary equipment, which cost in the neighborhood of $1,500, was operated for a short length of time and the results obtained were compared with those experienced in working with the existing gas equipment in their Heat Treating Department. Obviously, such a comparison could not be anything but favorable to electricity.

We went to see the management of this firm, with this question: If we install in your plant a modern gas furnace costing exactly the same amount, or less than the electric, and if that furnace will accomplish everything that the electric furnace? The answer was yes.

New Furnace Designed

No such furnace was available from the standard line of any furnace manufacturer in the country and it was necessary therefore for us to specify our requirements and spend approximately $3,000 for two furnaces, in order to stem the tide. A gas furnace exactly similar in size to the electric was installed and the results obtained were favorable to gas. Nevertheless, there was room for improvement, so we had a second furnace built embodying certain changes that were thought desirable from our experience with the first. This second furnace has been purchased by our customer and the figures in the following table will clearly show you why.

The Results

Test Data.	Electric Fur.	First Gas Fur.	Second Gas Fur.
Duration of test (hrs.)..	8.585	8.75	9.5
Furnace temp. at start..	1140°	800°	1000°
Time to bring to 1600° (hrs.)	1.5	1.75	1.5
Consumption to bring to 1600°	30 K.W.	740 cf.	534.6 cf.
Time operated at 1600° (hrs.)	7.085	7	7.5
Consumption during operating period.....	120 K.W.	2220 cf.	2777.87 cf.
Total fuel consumed....	150 K.W.	2960 cf.	3342 47 cf.
Total number of charges	17	21	32
Total number of pieces..	2890	3570	7200
Total weight (pounds)..	433.5	535.5	1080
Av. consump. per charge.	8.83 K.W.	141 cf.	104.45 cf.
Av. consump. per piece..	.053 K.W.	.83 cf.	.464 cf.
Av. consump. per pound.	.346 K.W.	5.53 cf.	3.09 cf.

In a few words, in this case the gas furnace turns out just as fine a quality of work as the electric, maintains automatically just as close a range of temperature, and has considerably greater output at a lower price per unit of production.

What has been accomplished here can be repeated in the great majority of cases, but intelligent, concentrated effort is required.

I recommend that you gentlemen give very careful consideration to the problem that has been outlined.

I urge that you co-operate with the managers of the gas companies of the country, the officers of the American Gas Association and with each other, in creating the great agencies that are essential to carry out a successful program.

I predict that you will be out of a job as industrial gas engineers if you don't.

GOOD WILL DEPARTMENT WORKS WONDERS

(Continued from page 588)

equally as much as they do the complaining customer. The office man hasn't the time nor the temper—after a busy day—to handle the complaint in a manner that makes a booster for the company.

"By having our salesmen-inspectors take up the troubles in the customer's own home unlimited time is available to adjust them in a friendly, informal way. There is no line of other restless customers waiting until the adjustment is settled. The customer is in a better mood, and so is the salesman."

Attitude of Public Changes

Mr. Hutchinson declared that there is already a marked change in the attitude of the public toward the company as a result of this good-will work.

Since the concern has been actively selling appliances it has adopted a policy of putting ranges out on approval. Of course, in doing this, salesmen are instructed to use their judgment in selecting prospective customers in whose homes the ranges are to be tried. The plan is working out in a highly satisfactory manner, according to Mr. Hutchinson. Recently the department placed 40 ranges in a certain section of the city, all on approval. Out of this number only four had to be taken out of the homes. All the other housewives in whose homes the ranges were signed contracts when the salesman went back for a decision.

The Sales Manager on the Job

Mr. Hutchinson, although busy in performing office routine, has a regular section of the city which he covers himself in making the inspections. He does this in order to learn of the sales objections the men must overcome. "By keeping on the job myself," he explained, "I know just what a man is talking about when he complains that he is having difficulty in closing a deal for certain items, for I have already had the same trouble myself."

NEWS OF THE GAS INDUSTRY

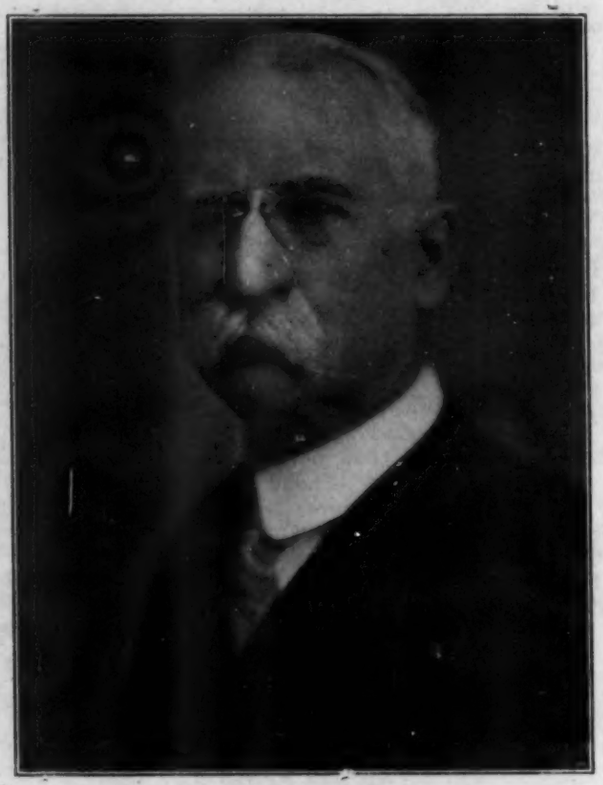
George D. Roper Passes Away

Well Known Appliance Maker and Civic Leader Dies of Heart Disease

Rockford, Ill.—George D. Roper, father of the Rockford city plan, leader in civic affairs and head of one of the largest gas stove manufacturing firms in the world, died at his home Tuesday, November 17, 1925. Death followed two years of suffering from a heart ailment which had confined him to his bed several weeks.

Mr. Roper had been engaged in the manufacturing business in Rockford the last 45 years and during that time had won the respect and admiration of hundreds. Not only was he honored for his capability in the industrial world, but as well for his unselfish and tireless efforts to make Rockford a more beautiful city. A leader in numerous civic movements, kindly and generous, his passing is deeply regretted.

His friendliness is reflected in the tributes in eulogy which business and social friends and acquaintances paid. Mayor J. Herman Hallstrom, who appointed him chairman of the city plan commission, expressed deep sorrow at his death and stated that the city loses a valuable friend.



George D. Roper

George Denny Roper was born in Springfield, Ill., February 5, 1855, a son of the late George S. and Louisa George Roper. He came to Rockford in 1880 and worked as traveling salesman for the Rockford Watch Company until 1885. He then took employment with the Van Wie Gas Stove Company.

Starts Stove Industry

The firm had its factory in the north part of the city. A disastrous fire wiped out the business and Mr. Van Wie left Rockford. Mr. Roper, manifesting at that early date the indomitable will and tenacity of purpose which eventually carried him to the topmost pinnacle in the stove manufacturing world, salvaged what he could in the ruins, reorganized and built a new factory and foundry in the water power district, near Kent creek.

His company was known as the Eclipse Gas Stove Company. Under his able direction the firm grew rapidly into industrial and financial importance. In 1919 it was merged with three other companies in kindred liens under the name of the George D. Roper Corporation. Today the firm is rated as the largest concern in the world manufacturing gas stoves exclusively.

Headed City Plan

Despite the demands made upon him by the busy industrial firm he headed, Mr. Roper found time to interest himself in the welfare of his city. He conceived the city plan, a comprehensive plan providing for systematically developing and beautifying the city. He spent much time and money in the furtherance of this cause.

Mr. Roper married Miss Kate Butterworth, member of a pioneer family of Rockford, December 11, 1888. She survives with a son, Mahon P. Roper, 1031 Franklin place. He also leaves a brother, E. U. Roper, of Los Angeles, Calif. He was a member of the Rockford lodge of Elks and was affiliated with the Loyal Legion and the Chicago Athletic Club.

Arthur H. Rand Chosen to Head Minneapolis Gas Light Co.

Minneapolis, Minn.—Arthur H. Rand, for four years general manager of the Minneapolis Gas Light Company, has been elected president of the corporation at a special meeting of the board of directors. He succeeds the late A. T. Rand, who died October 31 while on a hunting trip in northern Minnesota.

Mr. Rand's election to the presidency becomes effective immediately. He will retain the office of general manager, continuing as the chief operating official.

Rufus R. Rand, vice-president, and E. W. Brace, secretary and treasurer of the company, were re-elected by the directors.

Gas Course Popular at Johns Hopkins

15 College Men Studying Gas with Prof. Huff

For the current academic year the enrollment in the Department of Gas Engineering at Johns Hopkins numbers 15, of which 14 are candidates for university degrees, while one man, Walter Whetstone, Jr., is enrolled as a special student.

This enrollment attests the interest of the industry and of young men in educational work of the department. The manifest co-operation and support of the industry is particularly gratifying and to this co-operation must be attributed a large measure of any success which this work may achieve.

Nine of the young men are holders of scholarships offered by progressive gas companies, as shown in the following list:

Consolidated Gas, Electric Light and Power Company of Baltimore, Chas. M. Cohn, vice-president—Scholars: Raymond M. Finn, Baltimore; Stanley M. Lausch, Baltimore; R. Carroll Albrecht, Baltimore; Peter Kuiper, Baltimore.

C. H. Geist Company, Philadelphia, Pa., H. S. Schutt, vice-president and general manager—Scholars: Chas. S. Lind, Atlantic City, N. J.; James H. Lescure, Pitman, N. J.

Washington Gas Light Company, Ord Preston, president—Scholar: B. D. Wilson, Washington, D. C.

Southern Gas and Power Corporation, Philadelphia, Pa., Walter Whetstone, president — Scholar: Stephen G. Moran, Gadsden, Alabama.

Tampa Gas Company, Florida. John G. Gribbel, president—Scholar: Leonard A. Covell, Baltimore, Md.

One scholarship, that offered by the Mobile Gas Company, Mobile, Ala., through the efforts of Mr. Rufus C. Dawes and his associates, has not yet been awarded.

Each scholarship is worth about $350 a year to the recipient.

Men Enrolled on Personal Basis

The following men are enrolled in the department on a personal basis: D. T. Bonney, Pittsburgh, Pa.; D. T. Prahl, Manchester, N. H.; Walter Whetstone, Jr., Wayne, Pa.; Louis Herbst, Baltimore, Md.; Frank H. Dotterweich, Baltimore, Md.; Frank J. Maguire, Baltimore, Md.

The student body as a whole ranks with the best that the secondary schools produce. Most of the scholarships were awarded on a competitive basis.

In addition to the regular university work, the department is offering an extensive course on the utilization of gas. This course meets two hours weekly during the scholastic year and forms a part of the instruction offered in the Evening School for Technical Workers. Twenty-six young men from Baltimore and vicinity have registered in this course. The total number who are receiving instruction this year therefore numbers 41, or about twice the total for last year.

All this work has been made possible by the foundation of the Chair for Gas Engineering at Johns Hopkins University by the Southern Gas Association.

Bridgeton Keeps the Gas Fires Burning

Bridgeton Gas Light Co. Reaches 68th Birthday

The Bridgeton Gas Light Company has reached its 68th birthday.

Sixty-eight years ago, November 15, 1857, gas was first supplied to the citizens of Bridgeton. Never for a single second has the gas been turned off, day or night. Nor have the fires at the plant ever gone out during that time.

The Bridgeton Gas Light Company has always been a local industry, both as to capital and management. In the early days of their incorporation the old Davis House and the Cumberland Nail and Iron Mill, both old landmarks, played a prominent part in the founding of the company. The good old names of Mulford, Nixon, Whitaker, Potter, Woodruff and Laning were associated also in the early history and success of the company.

As to management, the late Benjamin F. Harding, superintendent and treasurer, was identified with the company for a period of 43 years, until his death. He was suceeded by the present superintendent and treasurer, Jacob B. Jones.

Under the direction of these two men, the company has grown from a small plant employing four men, with a gas holder of only 10,000 cu. ft. capacity and sending out 4,425 cu. ft. daily at $4 per 1,000 cu. ft., until today the plant has sixty employees, with holder capacity of 400,000 cu. ft. and an average daily send-out of 390,000 cu. ft., at $1.70 per 1,000 cu. ft.

The gas company has always been just ahead of the growth of the city of Bridgeton, by having its mains extended to meet the developments of the city, and the consumers have been able to have continuous service without a moment's interruption throughout the entire 68 years.

In summing up the growth of this company it is obvious that service has been the foundation on which it has built its success. The company is known throughout the gas industry as rendering a distinct "service after sale" to its consumers.

The Bridgeton Gas Light Company has always been distinctively a Bridgeton institution.

The officers and directors are: Bloomfield H. Minch, president; Samuel P. Fithian, vice-president; William C. Mulford, secretary and auditor; Edward P. Bacon and Joseph H. Powell, directors.

It is owned by Bridgeton stockholders and the rather wonderful organization of employees is composed entirely of Bridgeton people. This no doubt accounts for the success of the company and the confidence which the public has in it.

Southwestern Public Service Association to Meet in April

An announcement has been received to the effect that the Southwestern Public Service Association, which includes electric, gas and electric railways, public service companies in Texas and Louisiana, will hold its next convention jointly with the Southwestern geographic division of the National Electric Light Association at Galveston, Texas, April 13 to 16, 1926.

Mr. E. N. Willis, of 43-44 Slaughter building, Dallas, is the secretary of the Southwestern Public Service Association and Mr. S. J. Ballinger, 201 South St. Mary street, San Antonio, Texas, is the secretary of the Southwestern division of the N. E. L. A.

Henry O. Loebell Gives Interesting Address at Meeting of Borough Gas Co. Employees

The "Use of Gas as Industrial Fuel" was the subject of an address by Henry O. Loebell before the engineers and sales force of the New Business Department of the Brooklyn Union Gas Company. The meeting was held in the auditorium of the gas company at No. 176 Remsen street. Mr. Loebell is the vice-president and general manager of the Combustion Utilities Corporation.

Mr. Loebell stated that gas was the most practical fuel. He said that every gas company should conduct an educational advertising campaign and that this should be done throughout the whole United States in order to advise the manufacturers and business men as to the practicability of gas as fuel for their industries. He stated that gas companies in general throughout the country were not imparting this information to the public as thoroughly as they ought to do.

"This advertising campaign," Mr. Loebell stated, "is necessary to overcome sales resistance, which comes from a lack of understanding of the fundamental principles of fuel economics and utilization by the public.

"You here in Brooklyn," continued Mr. Loebell, "have a corps of engineers whose duty it is to advise the manufacturers and public generally as to the use of gas for fuel purposes. The question is, 'Do you do it properly?'

"The factory manager is interested primarily in production; he wants equipment that will work. He is interested in continuous production and therefore looks with disfavor on what we may consider as experimental work, with its interruptions. But he does not appreciate that he may have some special process or has objected to some special specification in a process otherwise standard which takes his furnace entirely out of any standard merchandising class and can only be solved in his plant.

"Your sales approach to the factory manager will not be designed in general to sell him gas, but to determine for him a sound policy of fuel utilization considering the various fuels adaptable to his processes and the price limits within which their use is most economical. Having gained his acceptance of this as a sales basis and obtained his co-operation to make the necessary analysis of his operations, you will then obtain for him an interpretation of fuel costs in terms of his finished products by the means of an industrial survey.

"An industrial survey is being made in Brooklyn now. A canvass is being made of all factories that might possibly use gas as fuel. This survey brings out the places where with gas as fuel and innovations of processes the cost of manufacture will be reduced and gas fuel credited with those economies. The survey must go beyond the manufacturer's own knowledge of the process because the introduction of gas in the present existent furnace will not give us the economies we must have to offset the higher price of gas as compared with the present fuel.

"With this combination a definite recommendation can be made to a manufacturer that with a certain installation you can effect certain economies in his plant. The fact that gas is used as fuel is not a factor of primary importance in the sales presentation except as it is consistent with the fuel utilization policy which you have advanced. The economies you guarantee are in themselves the answer to any question regarding the technical phases of your proposition, and in the end the final factor in which the manufacturer is interested.

"In the industrial survey we find the basis of a common understanding of these three points. It allows the furnace manufacturer to obtain the analysis necessary to determine and interpret the technical

problems. It gives the gas company the details necessary for the follow-up of its united presentation of the need of a sound policy of fuel utilization. It gives the manufacturer a fuel survey of his plant and reveals the opportunities for greater economies of production."

Previous to his address, Mr. Loebell was entertained at luncheon by the Brooklyn Union Gas Company at the Hamilton Club.

Among those present at the luncheon were Arthur F. Staniford and Clifford E. Paige, vice-presidents; H. E. McGowan, secretary; John T. White, assistant secretary; Herbert Wellington, assistant secretary; George M. Kirchmer, Prescott B. Wiske, new business manager; Robert H. Staniford, assistant new business manager; C. C. Atwood, Thomas P. Payne and John I. Blanchfield.

Brooklyn Union Gas Men Studying at Columbia

Brooklyn, N. Y.—Sixty men of the Brooklyn Gas Company are taking the Columbia University Home Study Course on Manufactured Gas this winter. The course was prepared by Prof. Jerome J. Morgan, M. S., Ph. D., of the Department of Chemical Engineering at Columbia University, and will be conducted under his personal supervision.

Prof. Morgan has been assisted by A. E. Forstall, consulting engineer; C. E. Paige, vice-president of the Brooklyn Union Gas Company; F. C. Weber, gas engineer, Cities Service Company, and W. S. Yard, vice-president of the Pacific Gas and Electric Company, in the preparation of the course. Students from all over the United States have enrolled for this course of study.

Its purpose is to give to the men interested in the gas industry an education in the manufacture of gas and its distribution in order that better service may be given to the public.

The men from the Brooklyn Union Gas Company taking the course and their departments are as follows: Engineering Department, E. F. Reardon, W. Benson, S. Green, J. Viebrock, R. MacSaveny, T. Werkle, C. P. Cornell, J. Burmeister, H. C. Nodein, G. J. Bischof, C. A. Rodd, E. Ford, C. DuBois, W. MacSaveny, C. Geiger, W. F. Uhlig, J. J. Garland, F. R. Gengo; construction department, H. F. Crofton, G. V. Van Buren, W. F. Breeves, C. C. Dawkins, W. W. Kunze, R. L. Heeren, H. P. Kirkham, O. J. Aumuller, S. M. Kline, F. H. Sewall, W. M. Cunningham, P. E. Teel, J. F. Miller, J. G. Young, G. A. Verrill, W. M. Wepfer; holder distribution department, J. C. Devlin, H. J. Robinson, C. E. Goldsmith, J. A. Miederich; street department, F. M. Roesch; new business department, R. H. Staniford, J. F. Quinn, H. Behrman, F. D. Tansey, J. Jares, R. E. Brown, R. Loomis; laboratory, L. A. Greiner, S. Grierson, H. F. Murphy, R. J. Sheridan, G. Zeigelmeyer, J. J. Flaherty, J. A. Morrison, R. F. Fisher; branches, A. L. Smith, R. M. Bellmer, H. A. Muirhead; shop distribution department, S. W. Jeffrey, T. Perry, J. C. Robbins, Jr.; vice-president's office, H. T. Gayley.

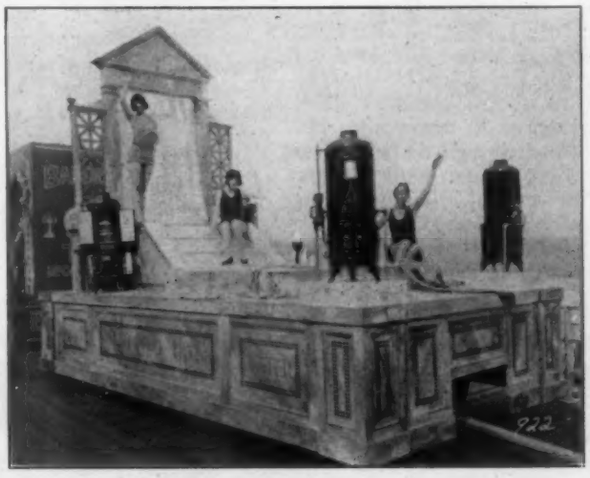
Plan Gas Merger in Pennsylvania

Pittsburgh, Pa.—At a special meeting called for January 7, 1926, stockholders of the American Natural Gas Company will be asked to approve the transfer of the company's natural gas properties, valued at $14,000,000, to its subsidiary, the Columbia Natural Gas Company. The latter, in turn, will be merged later with the Peoples Natural Gas Company and operated as a subsidiary of it, according to Henry Wittmer, president of the American Natural Gas Company.

The American company serves a wide portion of Western Pennsylvania, including both domestic and industrial consumers in Apollo, Etan, Ford City, Kittanning, Indiana, Vandergrift, Leechburg, Natrona, Glenshaw, Harmony, Zelienpole, Evan City, Allison Park, Gibsonia, Grapeville, Harmarville, Homer City and other towns.

In discussing the proposed merger, Mr. Wittmer said: "The necessity soon to seek other fields of supply and engage in the costly extension of lines is one of the principal factors that influences this proposal. At present our territory and that supplied by the Peoples company overlap, with resultant duplication of distribution, competitive drilling and overhead operation.

"Operated in conjunction with the Peoples Natural Gas Company, the new subsidiary obviously will be better able to effect numerous economies and continue for a long period to render satisfactory serv-



Fair Bathers Enjoy Hot Water Baths with the Aid of Ruud Heaters—A Float in the Recent Beauty Contest at Atlantic City

ice to both domestic and industrial consumers."

Confirming the part of the Peoples Natural Gas Company in the project, John B. Tonkin, vice-president and general manager of that organization, said: "Consumers of both companies will be benefited by the merger through the elimination of competitive efforts in Allegheny, Armstrong, Clarion, Jefferson, Indiana and Westmoreland counties."

Brooklyn Union to Pay Back Dividends

Brooklyn, N. Y.—Stockholders of the Brooklyn Union Gas Company will receive on January 11, 1926, $7 a share to represent dividends not paid during the years 1920 and 1922. Owing to the 80-cent gas law, recently declared unconstitutional, the Brooklyn Union Gas Company was unable to make a dividend during the above years.

Money for the new dividend has been realized through the sale of the Flatbush Gas Company to the Brooklyn Edison Company of its entire electrical business. The former company was a large subsidiary of the Brooklyn Union Gas Company and has paid a large debt through the proceeds of the recent sale.

The $7 a share distribution by the Brooklyn Union Gas Company is equal to a rate of 8 per cent per annum on the par value stock as constituted during the time of suspension of dividends. The exact dates when dividends were not paid were between January 1, 1920, and July 1, 1922.

The average rate paid in dividends by the Brooklyn Union Gas Company to its stockholders since its organization 30 years ago, including the above distribution, equals only 6.70 per cent on its outstanding capital stock. As the actual value of the company's property is greatly in excess of its capitalization, the return received by the stockholders on the capital employed in public service has been much below that figure.

Holders of the Brooklyn Union Gas Company's 7 per cent convertible debentures will have an opportunity of participating as stockholders in the aforesaid cash distribution by availing themselves of the privilege of converting their bonds into capital stock.

The Brooklyn Union Gas Company and its subsidiary companies expended during the three-year period ending July 31, 1924, approximately $11,800,000 for the purchase of property and the extension of its works and stations, extensions of mains and installations of services and meters. These extensions were rendered necessary by the increasing demands for gas and the development of the company's business.

Southern Gas Expanding

The Southern Gas and Power Corporation is completing negotiations for the purchase of several gas properties in New York, Pennsylvania and Maryland. The company now controls gas properties in Georgia, West Virginia, Virginia, North Carolina and Alabama.

There will be financing in connection with the new purchases. It is expected that additional issues of Class A stock and convertible notes will be offered within a few weeks.

Gas Engineer Promoted

Charles A. Harrison, who has been serving the Public Service Company of Colorado as gas distribution engineer, has been advanced to the position of assistant to General Superintendent V. L. Board, and in his new position will have supervision over tar, rate, claims, personnel, transportation and many other incidentals.

Mr. Harrison is a young man, a graduate electrical engineer, who joined the gas company as a cadet engineer shortly after graduating. The late war called him and after his return from the fray he became superintendent of the gas department of the Cheyenne plant. In 1920 he was transferred to the Saline, Kansas, plant, in a similar position, coming to Denver in 1924 as distribution engineer and now as related hereinbefore.

Linde Air Products Co. Announces Changes in Management

At the last meeting of the board of directors of the Linde Air Products Company, Mr. G. W. Mead, formerly president, was elected chairman of the board. Mr. W. F. Barrett, formerly vice-president, was elected to the presidency.

In addition to these changes, Mr. R. R. Browning was elected vice-president in charge of sales activities and Mr. J. A. Rafferty vice-president in charge of engineering, manufacturing and research.

M. J. Carney Elected Chairman of the Board, the Prest-O-Lite Co.

At a recent meeting of the board of directors of the Prest-O-Lite Co., Inc., Mr. M. J. Carney, formerly president, was elected chairman of the board. Mr. William F. Barrett, formerly vice-president, was elected to the presidency. Mr. Ralph R. Browning was elected vice-president in charge of acetylene sales activities. Mr. R. J. Hoffman was re-elected vice-president in charge of storage battery and automotive divisions.

Pacific Coast Gas Association Meets in San Francisco

The Pacific Coast Gas Association met on November 19-20, 1925, in San Francisco, Calif. The program of the meeting was as follows:

November 20, general meeting: Auditorium, ground floor, Pacific Gas and Electric building, 245 Market street, President F. J. Schafer chairman.

9:30 a. m.

Paper — Economics of High Pressure Storage, A. F. Bridge, executive engineer, Southern Counties Gas Co., Los Angeles.

Report—Dealers Bureau, Commercial Section, B. S. Pedersen, chairman, manager Geo. M. Clark & Co., San Francisco.

Paper—Accounting Procedure in Handling an Intensive Installment Sales Campaign, H. T. Terry, chief traveling auditor, Pacific Gas Electric Co., San Francisco.

2:00 p. m.

Paper—An Economic Study of Gas Manufacture. E. L. Hall, general superintendent, Portland Gas & Coke Co., Portland, Ore.

Paper—Large Gas-Fired Heating Installations, C. M. Grow, manager of new business, Southern California Gas Co., Los Angeles.

Address—Recruiting for a Company—12,000 Strong, E. G. McCann, manager of personnel, Pacific Gas & Electric Co., San Francisco.

6:30 p. m.

Informal dinner and entertainment, Commercial Club, Merchants Exchange building, 465 California street, President F. J. Schafer presiding.